REMARKS

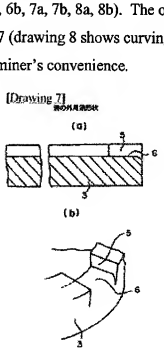
In reply to the Office Action of December 6, 2006, Applicant submits the following remarks. Claims 1, 19, and 20 have been amended. Support for the amendments to the claims can be found at least on page 4, lines 23-28 and FIGs. 1 and 4. The specification has been amended to correct a typographical error. Applicant respectfully requests reconsideration in view of the foregoing amendments and these remarks.

Section 102 Rejections

Claims 1-5, 7-9 and 18-21 were rejected under 35 U.S.C. § 102(b) as being anticipated by JP 08-11055 ("Hiroshi"). Applicant respectfully disagrees in light of the amendments to the independent claims.

Hiroshi shows a guide ring with a slots 5 (drawing 7, paragraph 60). A slot 5 can have an inclination or bevel in the bottom surface 6 (paragraph 67). The bevel causes the slot 5 to be deeper at the outer diameter than the inner diameter. The slot 5 can be curved at the periphery of the slot (paragraphs 14 and 55). Hiroshi shows the bottom of the slot as being flat, other than at the periphery (drawings 5a, 5b, 6a, 6b, 7a, 7b, 8a, 8b). The only drawing in Hiroshi that shows any curving in the slot is drawing 7 (drawing 8 shows curving outside of the channel). Drawing 7 is reproduced below for the Examiner's convenience.

[Drawing 7]



Amended claim 1 is directed to a retaining ring having a plurality of channels, each channel extending from the inner diameter surface to the outer diameter surface and having a curved section defining a rounded ceiling, wherein the curved section extends from the inner diameter to the outer diameter.

Hiroshi does not teach or suggest a channel in a ring with a curved section extending from an inner diameter surface to the outer diameter surface. Rather, Hiroshi teaches forming a curved peripheral edge on a channel. Thus, only the part of the channel that is on the outer diameter of the retaining ring is curved. The curved portion in Hiroshi does not extend from the inner diameter surface to the outer diameter surface. Further, the curved peripheral edge does not form a rounded ceiling, but a bullnosed edge or saddle shape. For at least these reasons, applicant submits that claim 1, as well as claims 2-5, 7-9, 18 and 21, which depend from claim 1, are not anticipated after the amendment to claim 1.

Amended claim 19 is directed to a carrier head with a retaining ring having a plurality of channels, each channel extending from the inner diameter surface to the outer diameter surface and having a curved section defining a rounded ceiling and substantially vertical side walls, wherein the curved section extends from the inner diameter to the outer diameter.

For at least the same reasons as provided above with respect to claim 1, applicant submits that claim 19 as amended is not anticipated by Hiroshi.

Amended claim 20 is directed to a method of polishing, including restraining a substrate with a retaining ring that has an inner diameter surface, and an outer diameter surface, and a plurality of channels, each channel extending from the inner diameter surface to the outer diameter surface and having a curved section defining a rounded ceiling a, wherein the curved section extends from the inner diameter to the outer diameter.

For at least the same reasons as provided above with respect to claim 1, applicant submits that claim 20 as amended is not anticipated by Hiroshi.

Withdrawal of the anticipation rejections is respectfully requested.

Section 103 Rejections

Claims 1-5, 7-9, 13 and 18-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kajiwara. The applicant respectfully disagrees.

As previously noted, Kajiwara describes grooves that have curved or hemispherical cross sections. A hemisphere does not have vertical side walls that have a distance therebetween that is constant for any distance. Any cross section of a hemisphere has opposing walls that converge or diverge from one another. Similarly, at one depth of a groove with a curved cross section, the distance to an opposing wall is not equal to the distance to an opposing wall at a different depth of the groove.

The Examiner argues that "it was held by In re Dailey, 357 F. 2d 69 . . . that shape is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular shape was significant. Kajiwara et al teaches that the grooves 240 perform slurry distribution. The motivation to provide the optimal shape of the ceiling of the grooves is to provide the optimal slurry distribution." (office action, page 5, emphasis added by Applicant). Applicant points out that the Examiner has ignored a key portion of In re Dailey, which the Examiner reproduced in the office action. That is, the inclusion of persuasive evidence that a particular shape is significant. In re Dailey, which is at 357 F.2d 669, 672-673 (CCPA 1966), states, "Appellants have presented no argument which convinces us that the particular configuration of their container is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious".

Applicant again note that the described shape of the channel is not "one of numerous configurations a person of ordinary skill in the art would find obvious." Channels with the claimed profile "permit a polishing fluid, such as slurry . . . to flow underneath the retaining ring to the substrate" (page 4, lines 12-18). The cross section of the channels affects the amount of slurry that is able to flow during the polishing process. As a retaining ring is used to polish wafers, the retaining ring material wears away. In a retaining ring with grooves that have curved or hemispherical cross-sections, the wearing of the bottom of the retaining ring decreases the width of the channel, which also decreases the amount of slurry flow under the retaining ring. In a retaining ring with channels having vertical side walls, wherein a distance between the side-

walls is constant from the bottom surface to the curved section and the side-walls have a length that is greater than the depth of the curved section, the width of the channels does not change as the retaining ring wears away until the ring is worn to the extent that the depth of the curved portion is reached. Because the width of the channel does not change over time, wafer to wafer polishing uniformity is more likely to be maintained than in a retaining ring with curved or hemispherical channels. Inter-wafer polishing uniformity is a goal in semiconductor processing, thus the shape of the channel is not merely one of design choice, but has a functional aspect. Thus, the particular shape of the channels is significant. For at least this reason, applicant submits that no *prima facie* case of obviousness has been made with respect to claims 1-5, 7-9, 13 and 18-21. Withdrawal of the obviousness rejections is respectfully requested.

No fee is believed to be due. If, however, there are any charges or credits, please apply them to Deposit Account No. 06-1050.

Respectfully submitted,

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